

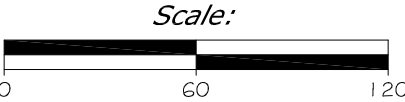
GENERAL NOTES

- 1. SHOULD THE CONTRACTOR EXCEED THE ROUTING INDICATED ON THE DRAWING, THE CONDUCTOR AND CONDUIT SHALL BE INCREASED TO ALLOW FOR A 4% (MAX) VOLTAGE DROP, AND THE CONTRACTOR MUST NOTIFY THE ENGINEER IN WRITING PRIOR TO ANY DEVIATION.
- 2. CONDUITS AND GROUND BOXES:
  - 1) ALL CONDUIT WORK COMPLETED BY GENERAL CONTRACTOR IS TO BE INSPECTED BY THE LICENSED ELECTRICAL CONTRACTOR PRIOR TO BURIAL.
  - 2) MINIMUM SIZE CONDUIT TO BE USED IS 1" FOR RCPT AND LIGHTING BRANCH CIRCUITS AND 2-1/2" FOR RV PEDESTAL CIRCUITS, SCHEDULE 40 PVC BURIED AT A DEPTH OF NOT LESS THAN 18", UNLESS OTHERWISE NOTED.
  - 3) CONDUIT WHERE ENTERING AND EXITING PEDESTAL BASES AND GROUND BOXES SHALL BE SEALED FROM DIRT, DEBRIS AND RODENTS (DUX SEAL, PERMA SEAL, ETC.).
  - 4) GROUND BOXES, WHERE USED, SHALL BE OUTDOOR RATED, AND INSTALLED FLUSH WITH FINISHED GRADE, OR NO MORE THAN 1" BELOW FINISHED GRADE. GROUND BOXES SHALL NOT BE INSTALLED HIGHER THAN FINISHED GRADE. GROUND BOXES SHALL BE ARRANGED TO DRAIN (GRAVEL BOTTOM, 3" MIN.).
  - 5) INSTALL PULL-ROPES THROUGH EACH PIECE OF CONDUIT INSTALLED.
- 3. WIRING METHODS:
  - 1) WIRE INSTALLED IN RV PEDESTAL CONDUIT RUNS SHALL NOT BE SMALLER THAN #300 AWG THWN ALUMINUM STRANDED CONDUCTOR, UNLESS NOTED OTHERWISE.
  - 2) WIRE INSTALLED IN RV PEDESTALS SHALL LAND ON THE LOOP FEED LUG TERMINAL BAR. THE CONTRACTOR MAY USE PIN TERMINAL CONNECTORS IN THE BASE OF THE PEDESTAL TO REDUCE FEEDER CONDUCTORS TO THE MAXIMUM CONDUCTOR SIZE ALLOWED BY THE PEDESTAL LUG TERMINAL BAR. USE OXIDE INHIBITOR FOR ALL ALUMINUM CONDUCTOR TERMINATIONS.
  - 3) COLOR CODE FOR WIRING SHALL BE CONSISTENT THROUGHOUT INSTALLATION.
  - 4) GROUND BOX SPLICES SHALL BE MADE WATER TIGHT.
- 4. PEDESTAL INSTALLATION AND WIRING:
  - 1) PEDESTALS AND PEDESTAL BASES SHALL BE PROVIDED AND INSTALLED PLUMB AND LEVEL.
  - 2) PEDESTALS SHALL BE DIRECT-BURY TYPE.
  - 3) AFTER INSTALLATION, PEDESTAL BASES SHALL BE COMPACTED TO 95% MDD STANDARD.
  - 4) REFER TO THE TYPICAL ELECTRICAL PEDESTAL LOCATION DETAILS ON SHEET 15 FOR DIMENSIONAL INFORMATION FOR PEDESTAL PLACEMENT AT THE CAMPSITES.
- 5. SIZES INDICATED FOR PULL BOXES AND CONDUITS ARE MINIMUMS.
- 6. REFER TO THE WIRE AND CONDUIT SCHEDULE FOR WIRE AND CONDUIT TAGS.
- 7. ALL CONDUCTORS TO BE THWN, UNLESS NOTED OTHERWISE.
- 8. THE LOCATION OF ALL EXISTING UNDERGROUND UTILITIES ARE NOT REPRESENTED ON THIS DRAWING. THE CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES IN WRITING, MAKE HIS OWN SITE INVESTIGATION, AND SHALL BE RESPONSIBLE FOR SECURING THE EXACT LOCATION OF ALL EXISTING UNDERGROUND UTILITIES, BOTH PRIMARY AND SECONDARY, PUBLIC AND PRIVATE, THAT MAY INTERFERE WITH ALL DEMOLITION, TRENCHING, EXCAVATION, AND NEW CONSTRUCTION WORK PRIOR TO BEGINNING EXCAVATION. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO PROTECT EXISTING UTILITY LINES, INCLUDING POWER, PHONE, GAS, WATER, AND SEWER, AND SHALL NOTIFY THE ENGINEER PRIOR TO ALL EXCAVATIONS. ALL UNDERGROUND UTILITY LINES DISTURBED SHALL BE REPAIRED AT THE EXPENSE OF THE CONTRACTOR.
- 9. CONDUIT RUNS ON THIS DRAWING ARE SCHEMATIC AND SHOWN FOR IDENTIFICATION OF EXTERIOR POWER AND CONTROL WIRING REQUIREMENTS. SEE THE INTERIOR BUILDING ELECTRICAL PLAN(S) FOR CONDUIT ROUTING INSIDE OF THE BUILDING.
- 10.
  - RV# = RV PEDESTAL
  - PB# = PULL BOX
  - FC# = FUTURE CONNECTION

KEY NOTES

- 1. EXISTING PANEL 'C' INSIDE THE RESTROOM FACILITY. PROVIDE A NEW 50A-2P CIRCUIT BREAKER IN PANEL 'C' TO ACCOMMODATE THE NEW RV PEDESTAL (RV16) AT SITE A16.
- 2. PROVIDE A 1" CONDUIT STUB-OUT FOR CONNECTION TO FUTURE BICYCLE CAMP SITES. CAP AND SEAL CONDUIT, BURYING A 3/8" x 18" PIECE OF REBAR AT THE END OF THE CONDUIT FOR FUTURE LOCATE. CONFIRM ALL STUB-OUT LOCATIONS WITH F.W.P. BEFORE INSTALLATION.
- 3. DEMO THE EXISTING 200 AMP SERVICE AND PROVIDE A NEW 800 AMP SERVICE WITH ASSOCIATED METER BASE, CT CABINET, AND DISTRIBUTION PANEL. ALL RV PEDESTALS SHALL BE COLLECTIVELY SUB-METERED AT THE MDP. REFER TO THE ELECTRICAL RISER DIAGRAM ON SHEET 15 AND THE PANEL SUPPORT STRUCTURE DETAILS ON SHEET 12.

**CAUTION**  
EXISTING ELECTRICAL MAIN AND OTHER UNDERGROUND UTILITIES ARE PRESENT. THE CONTRACTOR SHALL MAKE HIS OWN INVESTIGATION TO OBTAIN THE EXACT INFORMATION NECESSARY TO PROTECT OR ACCESS ALL UNDERGROUND UTILITIES, BOTH PUBLIC AND PRIVATE.



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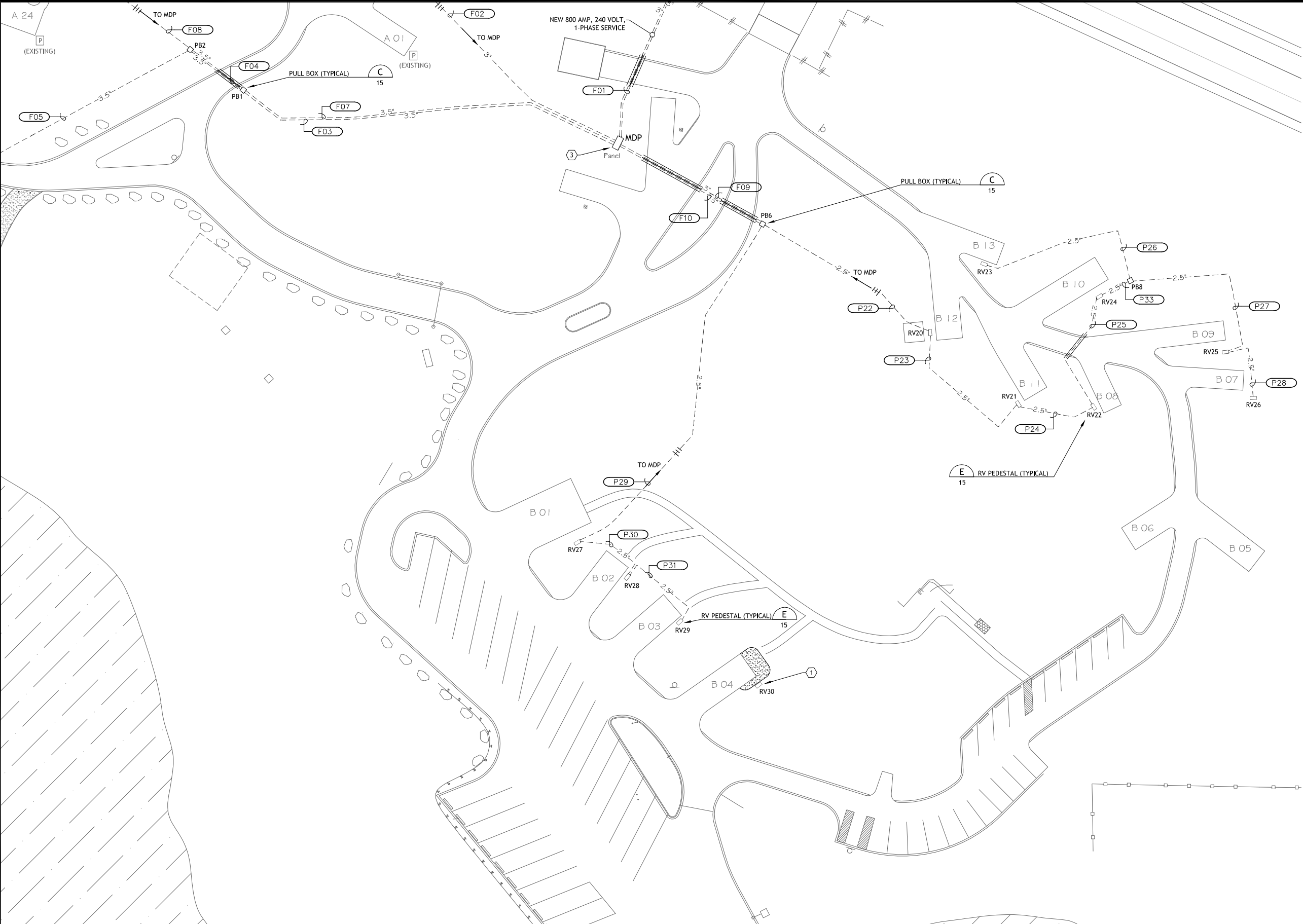
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Montana Fish & Wildlife

Loop A Electrical Plan  
Logan State Park Electrification and Dock Project





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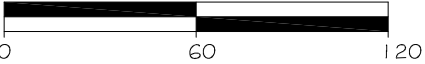
KEY NOTES

- 1. DEMO EXISTING RV PEDESTAL. INSTALL A NEW PEDESTAL IN THE NEW LOCATION INDICATED. REROUTE THE EXISTING BRANCH CIRCUIT CONDUCTORS TO THE NEW PEDESTAL LOCATION. BEWARE OF EXISTING BURIED CONDUIT. REFER TO "CAMPSITE B-04 IMPROVEMENTS" ON SHEET 11.
- 2. N/A
- 3. DEMO THE EXISTING 200 AMP SERVICE AND PROVIDE A NEW 800 AMP SERVICE WITH ASSOCIATED METER BASE, CT CABINET, AND DISTRIBUTION PANEL. REFER TO THE ELECTRICAL RISER DIAGRAM ON SHEET 15 AND THE PANEL SUPPORT STRUCTURE DETAILS ON SHEET 12

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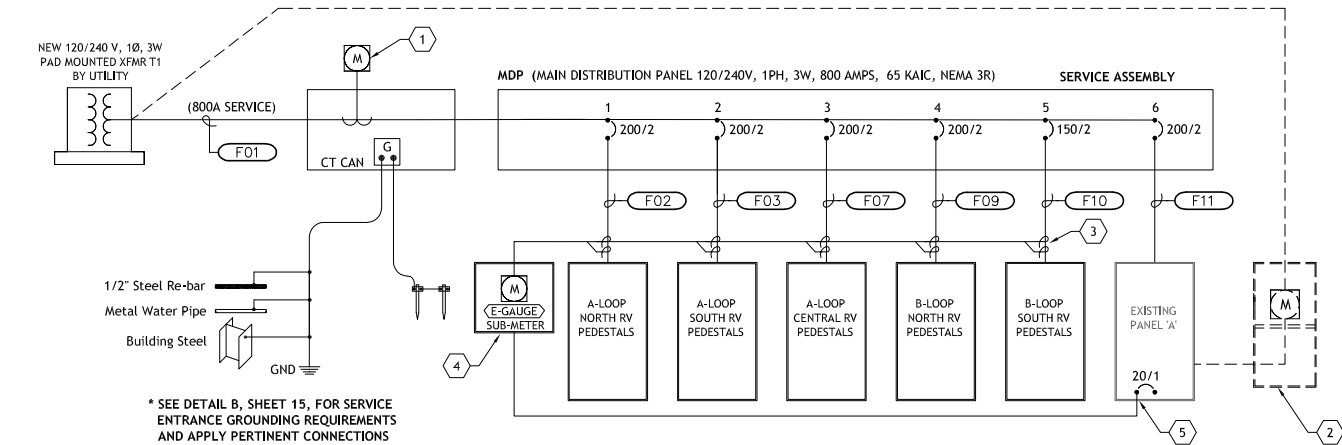
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Montana Fish & Wildlife  
Wildlife & Parks

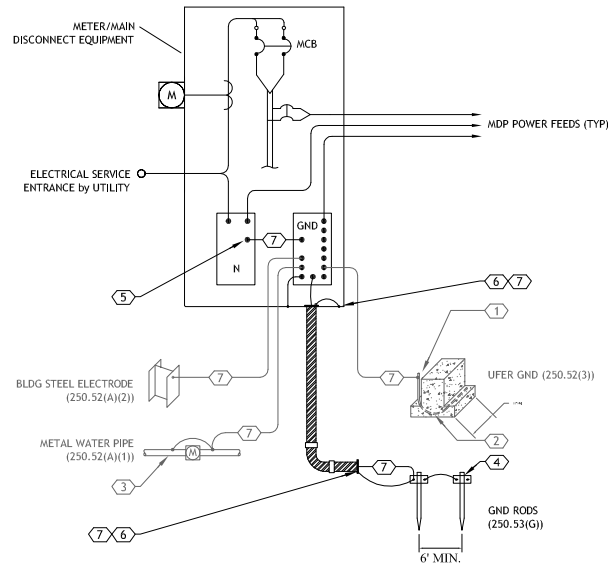
Loop B Electrical Plan  
Logan State Park Electrification and Dock Project



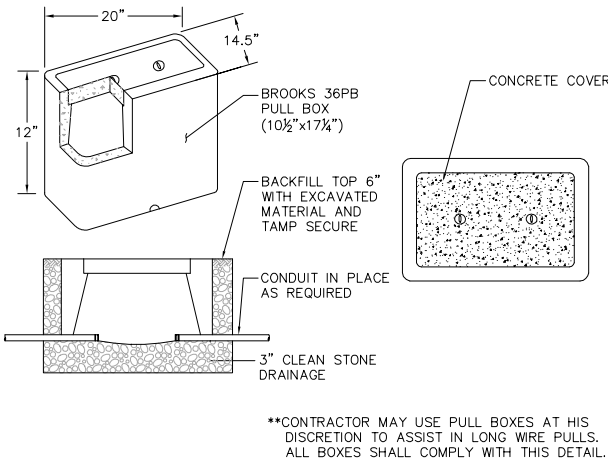


**A ELECTRICAL RISER DIAGRAM**  
SCALE: N.T.S.

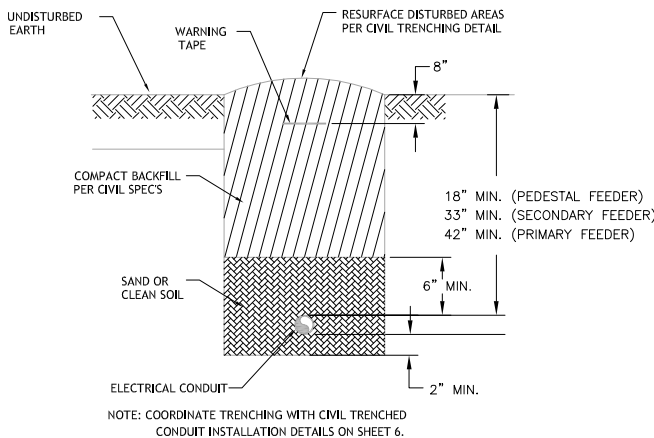
ELECTRICAL SITE PLAN - CONDUIT AND WIRE SCHEDULE					
TAG#	CONDUIT SIZE	WIRE SIZE	FROM	TO	AMPS
F01	(2) 3"	By Utility Company (FEC)	FEC XFMR	MDP	800A, 1Ø, 3W+G
F02	3"	3#500AL, 1#4AL GND	MDP	A-LOOP NORTH (RV1)	200A, 1Ø, 3W+G
F03	3-1/2"	3#750AL, 1#4AL GND	MDP	A-LOOP SOUTH (PB1)	200A, 1Ø, 3W+G
F04	(2) 3-1/2"	(2) 3#750AL, 1#4AL GND	PB1	PB2	
F05	3-1/2"	3#750AL, 1#4AL GND	PB2	PB4	
F06	3-1/2"	3#750AL, 1#4AL GND	PB4	PB5	
F07	3-1/2"	3#750AL, 1#4AL GND	MDP	A-LOOP CENTRAL (PB1)	200A, 1Ø, 3W+G
F08	3-1/2"	3#750AL, 1#4AL GND	PB2	PB7	
F09	3"	3#350AL, 1#4AL GND	MDP	B-LOOP NORTH (PB6)	200A, 1Ø, 3W+G
F10	3"	3#300AL, 1#4AL GND	MDP	B-LOOP SOUTH (PB6)	150A, 1Ø, 3W+G
F11	2-1/2"	3#250AL, 1#4AL GND	MDP	(E) PANEL 'A'	200A, 1Ø, 3W+G
P01	2-1/2"	3#300AL, 1#4AL GND	RV1	RV2	
P02	2-1/2"	3#300AL, 1#4AL GND	RV2	RV3	
P03	2-1/2"	3#300AL, 1#4AL GND	RV3	RV4	
P04	2-1/2"	3#300AL, 1#4AL GND	RV4	RV5	
P05	2-1/2"	3#300AL, 1#4AL GND	RV5	RV6	
P06	2-1/2"	3#300AL, 1#4AL GND	RV6	RV7	
P07	2-1/2"	3#300AL, 1#4AL GND	PB7	RV14	
P08	2-1/2"	3#300AL, 1#4AL GND	RV14	RV15	
P09	2-1/2"	3#300AL, 1#4AL GND	RV15	RV16	
P10	2-1/2"	3#300AL, 1#4AL GND	RV16	RV18	
P11	2-1/2"	—	RV18	PB3	
P12	2-1/2"	3#300AL, 1#4AL GND	RV18	RV19	
P13	2-1/2"	3#300AL, 1#4AL GND	RV16	RV17	
P14	2-1/2"	3#350AL, 1#4AL GND	PB5	RV8	
P15	1"	2#8Cu, 1#10 GND	PB5	RV8	
P16	2-1/2"	3#350AL, 1#4AL GND	RV8	RV9	
P17	2-1/2"	3#350AL, 1#4AL GND	RV9	RV10	
P18	2-1/2"	3#350AL, 1#4AL GND	RV10	RV11	
P19	2-1/2"	3#350AL, 1#4AL GND	RV11	RV12	
P20	1"	2#8Cu, 1#10 GND	RV12	RV13	
P21	1"	3#6Cu, 1#10 GND	PB5	BOLLARD (B)	
P22	2-1/2"	3#350AL, 1#4AL GND	RV16	PANEL 'C'	
P23	2-1/2"	3#350AL, 1#4AL GND	PB6	RV20	
P24	2-1/2"	3#350AL, 1#4AL GND	RV20	RV21	
P25	2-1/2"	3#350AL, 1#4AL GND	RV21	RV22	
P26	2-1/2"	3#350AL, 1#4AL GND	RV22	RV24	
P27	2-1/2"	3#350AL, 1#4AL GND	PB8	RV23	
P28	2-1/2"	3#350AL, 1#4AL GND	PB8	RV25	
P29	2-1/2"	3#350AL, 1#4AL GND	RV25	RV26	
P30	2-1/2"	3#300AL, 1#4AL GND	PB6	RV27	
P31	2-1/2"	3#300AL, 1#4AL GND	RV27	RV28	
P32	1"	—	RV28	RV29	
P33	2-1/2"	3#350AL, 1#4AL GND	PB7	RV14	
			RV24	PB8	



**B SERVICE GROUNDING DETAIL**  
SCALE: N.T.S.



**C TYPICAL PULL BOX DETAIL (PB#)**  
SCALE: N.T.S.



**D TYPICAL TRENCH DETAIL**  
SCALE: N.T.S.

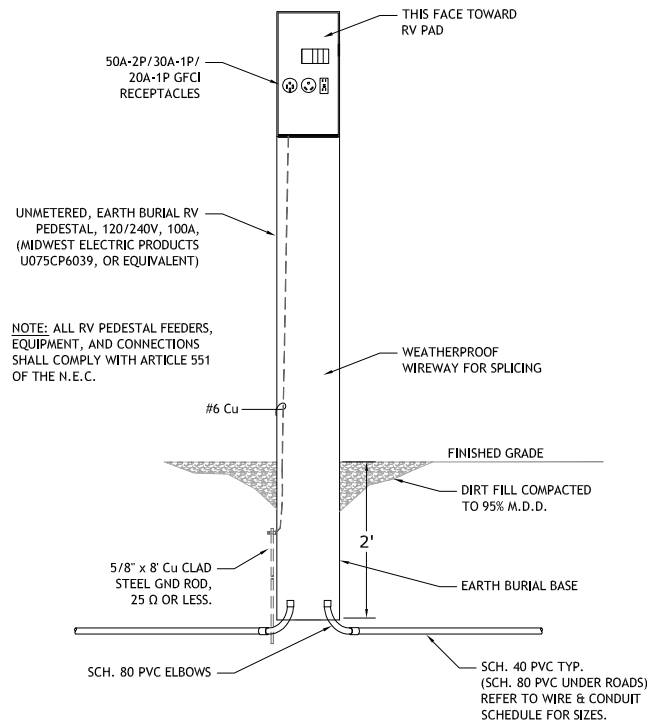
**DETAIL KEY NOTES:**

1. PROVIDE ENOUGH LENGTH TO TERMINATE DIRECTLY TO GROUND BUS.
2. INSTALL AN ELECTRODE ENCASED BY AT LEAST 2" OF CONCRETE, LOCATED WITHIN AND NEAR THE BOTTOM OF A CONCRETE FOUNDATION OR FOOTING THAT IS IN DIRECT CONTACT WITH THE EARTH, CONSISTING OF AT LEAST 20 FT OF ZINC GALVANIZED OR OTHER ELECTRICALLY CONDUCTIVE COATED STEEL REINFORCING BARS OF NOT LESS THAN 1/2" IN DIAMETER, OR CONSISTING OF AT LEAST 20 FT OF BARE COPPER CONDUCTOR NOT SMALLER THAN #4 AWG. REINFORCING BARS SHALL BE PERMITTED TO BE BONDED TOGETHER BY THE USUAL STEEL TIE WIRES OR OTHER EFFECTIVE MEANS.
3. GROUND THE INTERIOR METAL WATER PIPE WITHIN 5 FEET OF THE WATER PIPE ENTRANCE TO THE BUILDING. GROUNDING PATH CONTINUITY, OR THE BONDING CONNECTION TO INTERIOR PIPING, MUST NOT RELY ON WATER METERS OR SIMILAR EQUIPMENT (NEC 250.53(D)).
4. (2) 5/8" x 8'-0" COPPER CLAD STEEL GROUND RODS, 25 OHMS OR LESS. CLAMPS SHALL BE RATED FOR DIRECT BURIAL.
5. PROVIDE COPPER BONDING JUMPER SIZED PER NEC 250.28(D) OR FACTORY PROVIDED NEUTRAL TO GROUND BAR LINK. THIS IS THE ONLY PLACE IN THE BUILDING WHERE NEUTRAL TO GROUND SHALL BE BONDED TOGETHER.
6. BOND ALL METAL RACEWAYS CONTAINING GROUNDING ELECTRODE CONDUCTORS AT BOTH ENDS AS REQUIRED BY NEC 250.64(E). PROVIDE GROUNDING TYPE BUSHINGS AND FITTINGS.
7. BONDING JUMPERS AND COPPER GROUNDING ELECTRODE CONDUCTORS SHALL BE SIZED BASED UPON ELECTRICAL SERVICE SIZE (NEC 250.66).

**KEY NOTES**

1. METERING EQUIPMENT SHALL BE SUBMITTED TO LOCAL UTILITY COMPANY FOR SIGNATURE APPROVAL AND THEN TO ELECTRICAL ENGINEER OF RECORD FOR APPROVAL.
2. DEMO EXISTING ELECTRICAL SERVICE AND ASSOCIATED METER BASE. BACKFEED EXISTING PANEL 'A' THROUGH THE NEW MDP.
3. SPLIT-CORE CURRENT TRANSFORMER, 200 AMP, (TWO PER PANEL, TEN TOTAL). eGAUGE JD-SCT-024-0200, OR EQUIVALENT.
4. POWER METER SUB-METERING DEVICE IN LOCKABLE NEMA 3R ENCLOSURE. 6 CHANNELS MINIMUM; 240 VOLT, 200 AMP MINIMUM; 64-REGISTER DATABASE. THE SUB-METER SHALL MONITOR POWER USAGE FOR ALL RV CAMPSITES ON BOTH LOOPS 'A' AND 'B'. ENERGY USAGE DATA SHALL BE COLLECTED LOCALLY BY PARK SERVICE PERSONNEL VIA A LOCAL, RJ45, ETHERNET CONNECTION. INTERNET CONNECTIVITY IS NOT AVAILABLE NOR REQUIRED. PROVIDE USER-INTERFACE SOFTWARE TO BE LOADED ON A PARK SERVICE LAPTOP. PROVIDE A 5-YEAR WARRANTY. THE SUB-METER SHALL BE AN eGAUGE #EG3000 IN A POWERED ENCLOSURE KIT (PEK), OR EQUIVALENT.
5. PROVIDE A DEDICATED 120V, 20 AMP BRANCH CIRCUIT FROM EXISTING PANEL 'A' TO THE POWER METER ENCLOSURE. PROVIDE A NEW 20A-1P CIRCUIT BREAKER IN PANEL 'A' (MATCH EXISTING BREAKER TYPES).

LIGHTING FIXTURE SCHEDULE									
TYPE	DESCRIPTION	LAMPS PER FIXTURE	WATTS PER LAMP	LAMP SIZE	VOLTS	MAX WATTS	MOUNTING	MFG & P/N	NOTES
B	Bollard Light	1	30	LED 4000k	120	30	Bollard	Lumec: DOSB1-30W16LED4K-120V-GFI1-8KTX	Black textured finish; Provide 15A, 120V, GFI receptacle.



**E RV PEDESTAL DETAIL**  
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**Montana Fish & Wildlife**

# Electrical Riser Diagram & Details

## Logan State Park Electrification and Dock Project

SHEET: 15 of 15